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## V.

### *Contributions to the Bryology and Hepaticology of North America.*

By WILLIAM S. SULLIVANT.

#### PART II.

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(Communicated to the Academy, November 8th, 1848.)

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1. *LESKEA FENDLERI* (sp. nov.): hermaphrodita; caule intricato-repente ramosissimo, ramis brevibus surrectis; foliis imbricatis erecto-patulis ovato-lanceolatis serratis evanidi-costatis; capsula oblonga suberecta subæquilaterali, operculo elongato-conico.

HAB. On rocks, in the vicinity of Santa Fé, *Mr. Fendler*.\*

\* The following list of Mosses and Hepaticæ, collected in 1847 near Santa Fé, New Mexico, by Mr. Fendler, will be interesting to the bryologist as indicating the range of species. It is proper to state that Mr. Fendler's knowledge of these orders was very limited, and that their collection was with him a secondary object; also that the adjacent mountains furnished none of the species here enumerated, the valley of the Rio Chiquito, or Santa Fé Creek, being his principal locality. — *Atrichum angustatum*, *Beauv.* *Barbula mucronifolia*, *B. & S.* *B. ruralis*, *Hedw.* *Bartramia fontana*, *Brid.* *Bryum argenteum*, *L.* *B. cæspitium*, *L.* *B. crudum*, *Schreb.* *B. Duvalii*, *Voit.* *B. inclinatum*, *B. & S.* *B. intermedium*, *Brid.* *B. pseudo-triquestrum*, *Schwægr.* *B. pyriforme*, *Hedw.* *B. Wahlenbergii*, *Schwægr.* *Ceratodon purpureus*, *Brid.* *Dicranum Muhlenbeckii*, *B. & S.* *D. rhabdocarpum*, *Sulliv.* *Encalypta ciliata*, *Hedw.* *E. rhabdocarpa*, *Schwægr.* *Fabronia pusilla*, *Schwægr.* *Fissidens bryoides*, *Hedw.* *Fontinalis antipyretica*, *L.* *Funaria hygrometrica*, *Hedw.* *Grimmia calyptrata*, *Hook.* *G. ovata*, *W. & M.* *Hedwigia ciliata*, *Hedw.* *Hypnum atrovirens*, *Schimp.* *H. catenulatum*, *Brid.* *H. cupressiforme*, *L.* *H. diversifolium*, *Schimp.* *H. luridum*, *Swartz.* *H. riparium*, *L.* *H. ruscifolium*, *Neck.* *H. salebrosum*, *Hoffm.* *H. stellatum*, *Schreb.* *Leskea attenuata*, *Schreb.* *L. Fendleri*, *Sulliv.* *L. polyantha*, *Hedw.* *L. Sprucei*, *Mont.* *L. tenuirostris*, *B. & S.* *Mnium cuspidatum*, *Hedw.* *M. serratum*, *Brid.* *Neckera oligocarpa*, *Schimp.* *Orthotrichum anomalum*, *Hedw.* *O. cupulatum*, *Hoffm.* *O. speciosum*, *N. ab E.* *O. Sturmii*, *H. & H.* *Polytrichum juniperinum*, *Hedw.* *Pottia subsessilis*, *B. & S.* *Pterigynandrum nervosum*, *Brid.* *Schistidium ambiguum*, *Sulliv.* *S. pulvinatum*, *Brid.*

DESCR. Planta late denseque cæspitosa. Caules prostratæ intricato-implexæ, ramos breves erectos teretes 3–4 lineares simplices vel ramulosos emittentes. Folia undique imbricantia erecto-patentia ovata longe-acuminata, vel ovato-lanceolata concava, margine inferiore reflexa, fere toto ambitu serrata, costa paulo ultra medium evanescente instructa, tenuissime lineari-areolata, cellulis ad angulos basis externos amplis quadratisque, e lutescente viridia nitentia. Perichætialia convoluta-oblonga ex apice lato rotundo laciniato-dentato in productionem linearem serratam flexuosam subiter desinentia. Antheridia archegoniis immixta ad vaginulæ basim; paraphysibus numerosissimis. Capsula oblonga, nunc subæqualis erectiuscula, nunc altero latere longiore convexiore paulo inclinata, ore subobliquo. Peristomii exterioris dentes lineari-lanceolati dense trabeculati, linea mediali notati; interioris processus e membrana lata carinati lineares pertusi longitudine denticulati, ciliolis rudimentariis vel nullis interpositis. Annulus compositus revolubilis. Pedunculus e caule flexuoso-erectus 5–7-lineas longus, basi lenissime papillosus, superne sinistrorsum, inferne dextrorsum tortilis. Operculum convexo-conicum, plus minus elongatum, rectum vel incurviusculum. Calyptra non visa.

TAB. I. — *Fig. 1.* A plant of the natural size. 2. The same, magnified. 3. A portion of stem. 4. The peristome. 5. Capsules. 6. Opercula. 7. The annulus. 8. The perichæth. 9. Archegonium, antheridium and paraphysis. 10. Vaginula and reproductive organs. 11. Perichætial leaves. 12. Stem and branch leaves. 13. Portions of leaf showing the reticulation. 14. A vertical section of the peristome, showing the columella, &c. All magnified except *Fig. 1.*

2. *SCHISTIDIUM AMBIGUUM* (sp. nov.): monoicum, exiguum, pulvinato-cæspitosum; caule parce ramoso; foliis oblongo-lanceolatis patulo-incurvis apice plus minus cano-piliferis, perichætialibus multo majoribus erectis elliptico-lanceolatis in pilum hyalinum grosse dentatum productis fere suæ longitudinis; capsula immersa oblongo-ovali, operculo convexo-conico brevi-rostrato; calyptra cuculliformi.

HAB. On dry rocks, near Santa Fé, *Mr. Fendler*.

The long, serrated, diaphanous points of the large perichætial leaves, the oblong-oval capsule, the small subconic operculum, and especially the cuculliform calyptra of this species, seem to require its separation from the variable *Schistidium confertum*, which in all other respects it closely resembles.

*Tetraphis pellucida*, *Hedw.* *Timmia megapolitana*, *Hedw.* *Weissia controversa*, *Hedw.* *W. curvirostris*, *Brid.* *Chiloscyphus polyanthos*, *Cord.* *Fegatella conica*, *Cord.* *Fimbriaria fragrans*, *N. ab E.* *Jungermannia barbata*, *Schreb.* *Madotheca platyphylla*, *Dumort.* *Marchantia polymorpha*, *L.* *Radula complanata*, *Dumort.* *Reboulia hemisphærica*, *Raddi.*

3. *FISSIDENS RAVENELII* (sp. nov.): dioica; caule declinato simplici minimo; foliis 8–16, (in caule sterili 18–20,) inferioribus parvulis ascendendo sensim majoribus, supremis linearibus acutis conniventibus ad medium usque conduplicatis, lamina immarginata toto ambitu subtilissime denticulata, floralium duplicaturæ marginibus limbatis repando-dentatisque, costa pellucida cum apice desinente instructis, densissime minuteque subquadrato-areolatis, siccis guttulatis; capsula erecta in pedicello sinistrorsum torto ovali-oblonga subpapulosa, peristomii dentibus dense trabeculatis, operculo conico-rostrato, calyptra conica uno latere fissa: flore masculo terminali.

HAB. Detected, March, 1847, by *H. W. Ravenel, Esq.*, on damp ground near the Santee Canal, South Carolina. Also at Society Hill, South Carolina, by *Rev. M. A. Curtis*.

A very distinct and well-marked species, nearly related to *F. exiguus*, *Sulliv.*, and *F. Bloxami*, *Wils.* The former of these two species is known by the looser and larger reticulation and the entire margin of its broader leaf; in the latter species, the want of a bordering to the margins of the duplicature, the vanishing of the dorsal ala considerably above the base of the leaf, and the position of the gemmiform male flower, are good distinctive marks. The protuberance of the outer cells of the capsule in the present species does not occur in the others above named. In *F. Ravenelii*, male and female gemmæ are occasionally met with in the axils of the lateral leaves of what in other species are considered infertile fronds. These gemmæ, upon the decay of the parent stock, become perfect plants. The same mode of propagation occurs in *F. bryoides*, *Hedw.*

TAB. II. — *Fig.* 1. Plant of the natural size. 2, 3, 4. The same, magnified. 5. Calyptra. 6. Capsule. 7. Tooth of the peristome, and spores. 8. The operculum. 9. A perigonal leaf. 10. Male gemma. 11. Antheridia. 12. A portion of the duplicature of a leaf. 13. Leaf of male gemma. 14. A portion of the lamina of a leaf. — All except fig. 1 magnified.

4. *BRYUM LESCURIANUM* (sp. nov.): dioicum, humile, laxe cæspitosum, viridi-lutescens (nullo rubore tinctum); caule simplici declinato terra semisepulto 4–6 lin. longo; foliis erecto-patentibus, inferioribus oblongo-lanceolatis, comalibus perichæatialibusque multo longioribus linearibus acuminatis, omnibus apice plus minus serratis medio margine reflexis densius lineari-areolatis, costa valida ad apicem usque producta; capsula ovali-subpyriformi in pedicello  $\frac{1}{2}$ –1 unciali basi geniculato flexuoso

erecto subpendula, annulo duplici revolubili, operculo subhemisphærico apiculato : planta mascula tenuiore, foliis perigonalibus externis e basi concava subiter linearibus patulis, intimis minoribus ovatis erectis.

*B. pulchellum*, *Musc. Alleghan. No. 101.*

**HAB.** Clay banks, in woods, Cincinnati and Lancaster, Ohio ; very rare.

The large size of this Moss, its long linear perichætil leaves furnished with a large nerve, the form of its perigonal leaves, the absence of redness in the foliage, and the presence of a conspicuous annulus, separate it from the closely related *B. pulchellum*, *Hedw.* — Named for my friend, Leo Lesquereux, who discovered the Lancaster locality of this Moss, and detected its specific characters.

5. *DICRANUM RHABDOCARPUM* (sp. nov.) : dioicum, densissime cæspitosum ; caule pluries dichotomo ascendente tomentoso-radiculoso ; foliis lutescente-viridibus nitidis erecto-patentibus (apicalibus sæpe subhomomallis) strictis concavis, caulinis lanceolatis, comalibus elongato-lanceolatis attenuatis, omnibus costa infra apicem dentatum evanida instructis, areolatione laxa ; capsula erecta ovali-cylindrica regulari sicca 5–8 costata exannulata, operculo oblique longirostro : flore masculo in planta tenuiore terminali.

**HAB.** Santa Fé, New Mexico, *Mr. Fendler.*

In general aspect, *D. rhabdocarpum* is very like *D. scoparium*. Its nearest affinity, however, is with *D. palustre*, *Brid.*, from which it is distinguished by its broader and less attenuated leaves, entirely destitute of transverse undulations, with points more obtuse and strongly dentate, but mainly by its erect regular and prominently ribbed capsule. It is also destitute of the slender upright shoots, with small oval and acute leaves, which occur in *D. palustre*.

**TAB. III.** — *Fig. 1, 2.* Female and male plants, of the natural size. *3.* Antheridium and paraphysis. *4.* Perigonal leaf. *5.* Peristome. *6, 7.* Capsules. *8.* Perichæth. *9, 9.* Stem leaves. *10, 10.* Perichætil leaves. *11.* Cross sections of the same. *12, 13.* Portions of the leaf showing the reticulation. — All except fig. 1, 2, magnified.

6. *HYPNUM OREGANUM* (sp. nov.) : dioicum ; caule prostrato parce ramoso ; ramis dense pinnatis ; foliis e basi lata cordata ovato-longe-acuminatis serrulatis striatis nitidulis tenuissime areolatis, costa sub apice dissoluta ; capsula in pedicello muriculato oblonga cernua annulata ; operculo conico longe rostrato.

HAB. Oregon, between Puget Sound and Columbia River. (United States Exploring Expedition.)

This species resembles, in many respects, *H. crispifolium*, from the same locality, as described and figured by Hooker and Schwægrichen. But the opaque subpapillose leaves of the latter species, with a minute subrotund areolation, is a mark abundantly distinctive. *H. Oreganum* is very nearly related to *H. prælongum*, from which it differs by its larger size, its more rigid and densely pinnated stems and branches, not compressed, its more striated longer-acuminated leaves, and by the want of a nerve in the perichæatial leaves, &c.

7. *HYPNUM OAKESII*, *Sulliv.* (*Gray's Manual of Bot.* p. 673): dioicum; caule prostrato pinnatim ramoso, ramis flexuosis compressiusculis; foliis lanceolatis acuminatis evanidi-costatis spinuloso-dentatis; capsula ovata gibboso-inæquali longipedunculata, operculo conico-rostellato.

HAB. On decayed prostrate logs, at the base of the White Mountains, New England, detected by the late *Wm. Oakes, Esq.*

DESCR. Planta decumbens, flexilis, viridi-lutescens, nitens, stratum laxè implexum efficiens. Caulis tri-quadruncialis, tomento radiculoso pluries dichotomo-furcato obsitus, irregulariter pinnatim ramosus, ramis dissitis patentissimis subcomplanatis elongatis flexuosis attenuatis. Folia costa circa medium evanida instructa, minute lineari-areolata, pluminus plicato-striata parcius rugulosa, margine reflexa; caulina concava, lato-ovata, brevius acuminata, patentia vel subsquarrosa; ramea ovalia, longe acuminata, patienti-erecta, apicem versus spinuloso- etiam lacinuloso-dentata. Perichætialia numerosa imbricatim conferta, exteriora reflexo-squarrosa, interiora convoluta erecta capillari-attenuata, omnia denticulata subecostata. Pedunculus e vaginula elongato-cylindrica tenuis, biuncialis et ultra, apice valde arcuatus, in sicco superne sinistrorsum inferne dextrorsum tortilis. Capsula ovata, gibboso-inæqualis, ventricosa, valde pachyderma, deorsum spectans. Peristomii exterioris dentes lineari-lanceolati dense articulati, interioris cilia lanceolata carinata, ciliolis binis interjectis. Annulus exilissimus vix ullus. Operculum conicum brevi-rostellatum. — Flos masculus in planta distincta gemmiformis, axillaris, 8–10 phyllus; perigonia ovata concava ecostata; antheridia 10–12 longius stipitata, paraphysibus immixtis.

Compared with *H. brevirostre*, *Ehrh.*, its nearest congener, *H. Oakesii* has a subpinnate (not subfasciculate) ramification; the branches straight (not incurved); leaves erecto-patent (not squarrose), oval, long-acuminate (not broadly cordate-triangular acuminate, not constricted at upper end of the lamina, nor convolute at the basal angles), strongly and

almost laciniately dentate (not slightly serrulate), with a single costa (not forked). The areolation of the leaf is more linear. The radicular tomentum of stem and branches is more abundant and much more compound in its ramification. The pedicel is longer, &c.

TAB. V. — *Fig. 1.* Plants of the natural size. 2. The same magnified. 3. The peristome. 4. Stem-leaf and cross section. 5. Branch-leaves and cross section. 6. Point of a leaf. 7. Male gemma. 8. Perichæth and vaginula. 9. Perichætial leaves. 10. Capsule and pedicel in a dry state. 11. Operculum. 12. Radicular tomentum with a portion of the stem. All magnified except fig. 1.

8. *SPHAGNUM TORREYANUM* (sp. nov.): robustum, sordido-fuscescens; caule pedali longiore firmo diviso; ramulis 4–5 fasciculatis inferne remotis superne confertis 12–15 lin. longis 3–4 lin. latis lineari-lanceolatis complanatis plumulosis laxe foliatis; foliis patulis convolutis elongato-lanceolatis apice tubiformibus minuteque eroso-dentatis margine e cellulis exilissimis 4–5 seriatim conflato circumductis serpentino-reticulatis, transversali sectione cellulas linea spirali notatas magnas subrotundas exhibentibus, cellulis chlorophyllosis minutis triangularibus exterius interpositis; fructu ignoto.

HAB. ESSEX County, New York, *Dr. Torrey*.

This species is at once recognized by its large size, considerably exceeding that of any of its American congeners, and by the color of the whole plant, much like that of *S. macrophyllum*, n. 18, of Drummond's Southern Mosses.\* The arrangement of the cells of the leaf is the same as in *S. cuspidatum*.†

\* This singular Moss is doubtfully referred by Hook. & Wils. to *S. macrophyllum*, *Brid.*, a species founded on specimens purporting to have been collected near Philadelphia. No American *Sphagna* known to me accord with Bridel's description of *S. macrophyllum*,—few present more important discrepancies than the present species. Specimens of it, under the name of *S. Georgianum*, *Schw. Mss.*, are to be seen in the Schweinitzian herbarium, together with notes made (previous to 1820) by Dr. Torrey, pointing out the peculiar structure of the large cells of the leaf, which are destitute of a spiral fibre and furnished throughout their whole length with a line of unusually large and conspicuous stomata. In the event of Bridel's Moss proving to be different (which is highly probable), Schweinitz's name, "*Georgianum*," is entitled to adoption.

† The form and relative position, as seen in a cross section of the two kinds of cells comprising the leaf of *Sphagnum*, will aid in distinguishing the species. In Tab. IV. B., figs. 1, 2, 3, 4, *a* represents a cross section of the large cells, which are always destitute of chlorophyll, having their sides perforated with large circular openings or stomata, and lined (excepting in "n. 18," Drummond, l. c.) with a spiral fibre; *b* represents the same section of the small linear cells containing chlorophyll only. In the North American species, the principal types of structure appear to be the four following. Fig. 1 (tab. l. c.), large circular cells placed in con-

9. *FRULLANIA PLANA* (sp. nov.): monoica; caule procumbente vage ramoso vel subpinato; foliis subimbricatis orbiculatis auriculis parvis galeiformibus æque longis ac latis tectis cauli contiguis; amphigastriis magnis planis rotundis breviter bifidis sinu laciniisque acutis caule triplo latioribus; involucri lobis ovalibus, lobulis amphigastriique laciniis linearibus margine reflexis subrepandis, his utroque margine inferne unidentatis; perianthiis (interdum binatis) in ramulo brevi semi-exsertis oblongo-ovalibus vel subobovatis triquetris dorso sulcatis ventre acute unicarinatis sublævibus: spica mascula globosa.

*F. dilatata*, *Musc. Alleghan. No. 269.*

**HAB.** Chimney rocks, on the French Broad River, Eastern Tennessee.

The large plane amphigastrium, the small auricle, the oval perianth, and the considerably larger size of the whole plant, distinguish this species from *F. Eboracensis* and *F. saxatilis*. The two latter are probably one and the same species.

10. *FRULLANIA NISQUALLENSIS* (sp. nov.): digyna; caule procumbente pinnatim decomposito; foliis conferto-imbricatis oblique ovalibus acuminatis apiculatis valde inflexis, auriculis parvis ovali-galeiformibus; amphigastriis obovato-rotundis caule duplo latioribus bifidis sinu laciniisque obtusiusculis margine reflexis; involucri lobulis amphigastriique laciniis linearibus deflexo-falcatis basi cristato-ciliatis; perianthio ovali-obovato subimmerso trigono dorso convexiusculo ventre alte unicarinato.

**HAB.** Fort Nisqually, Oregon, on the bark of trees. (United States Exploring Expedition.)

In size, color, and ramification, this species is strikingly like *F. Tamarisci*. But its acuminate, apiculate, and inflexed leaves place it in the same section with *F. paradoxa*,

tact, with small triangular ones interposed on the outside of the leaf; *S. cuspidatum*, Ehrh.; *S. recurvum*, P. de B.; *S. molluscum*, Bruch.; *S. Torreyanum*, Sulliv. Fig. 2, both kinds of cells as in fig. 1, except that the small cells are placed on the inside of the leaf; *S. acutifolium*, Ehrh.; *S. humile*, Schimp.; *S. tabulare*, Sulliv.; *S. molle*, Sulliv. Fig. 3, large circular or oval cells not in contact, with small oval ones centrally interposed; *S. macrophyllum*, Brid.? *S. squarrosus*, W. & M. Fig. 4, large quadrangular cells in contact only at their outer and inner angles, with centrally interposed small elliptical ones; *S. cymbifolium*, Ehrh.; *S. compactum*, Brid.; *S. sedoides*, Brid.; *S. strictum*, Sulliv.



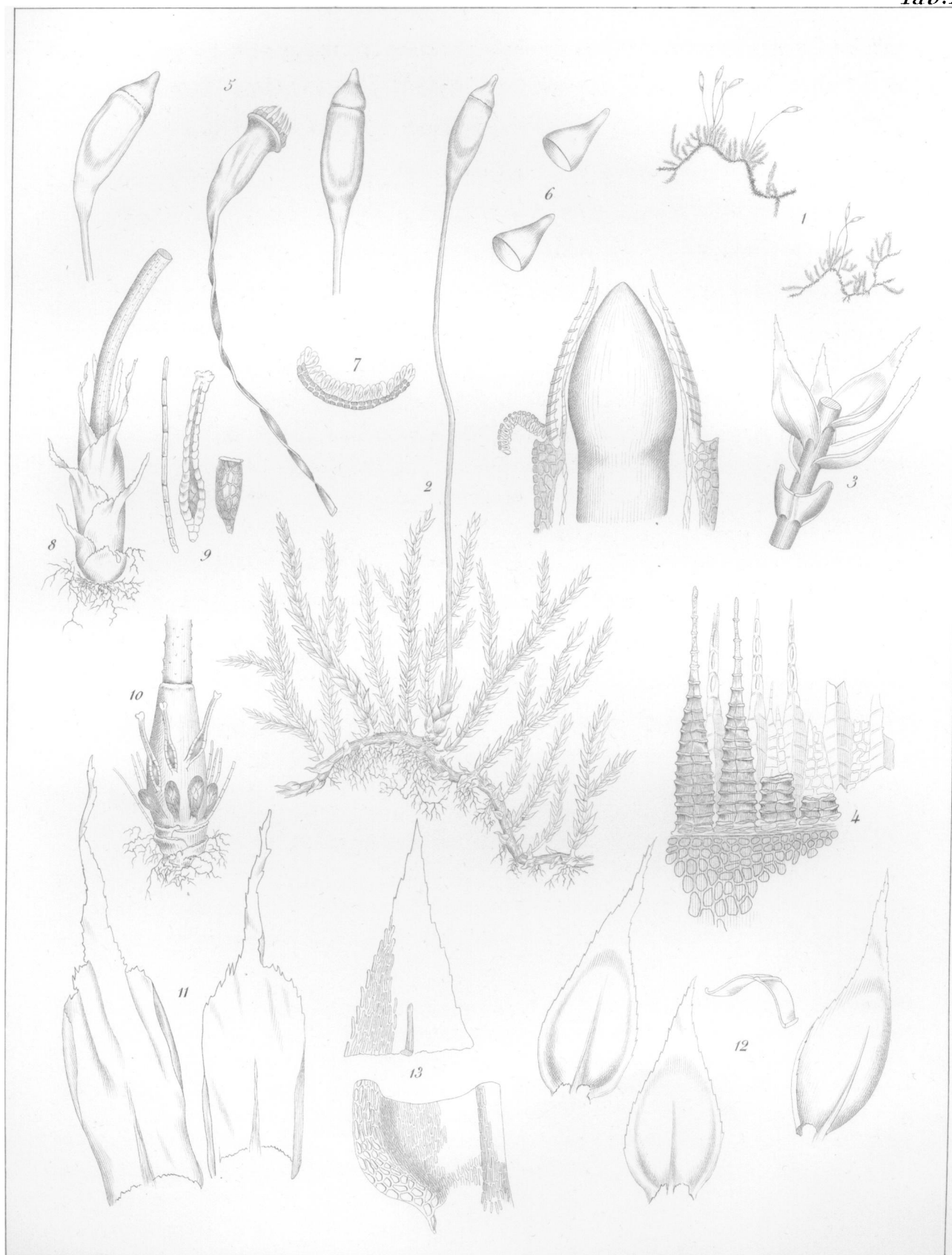
atrata, Liebmanniana, &c. It is easily distinguishable from them, however, by the amphigastrial laciniae and lobule of its involucre, which are long uncinatè and ciliate-dentate at the base.

11. *RICCIA LUTESCENS*, *Schweinitz*! Fronde viridi-lutescente cavernosa stellatim expansa unciali et majore plus minus dissecta, laciniis subtrichotomis linearibus 1–2 lineas latis canaliculatis subplanis subtus convexiusculis radiculis margine subundulatis apice dilatatis emarginato-bilobis supra turgidis subtus squamatis, squamis transversalibus lunulato-ovatis teneris pellucidis albidis; fructu ignoto.

*Schw. Hepat. Amer. p. 26, n. 2.*—No. 156, *R. velutina*, *Hook. & Wils.*! in Drummond's Southern Mosses.—*Hook. Icon. Plant. v. 3, t. 249* (excl. plant. fructif.).

HAB. Moist ground and river-banks subject to inundations; Ohio and Southern States, frequent. No fruit has yet been found. The fruit figured in *Hook. Icon. Plant. l. c.*, Mr. Wilson informs me, belongs to *R. crystallina*.

TAB. IV. A.—*Fig. 1.* Plant, of the natural size. 2. A portion of the epidermis. 3. A cross section of a plane part of the frond. 4, 5. Cross sections of the thickened end of the frond. 6. Longitudinal section of the same. 7. Under side of the same, showing the scales.—Magnified.

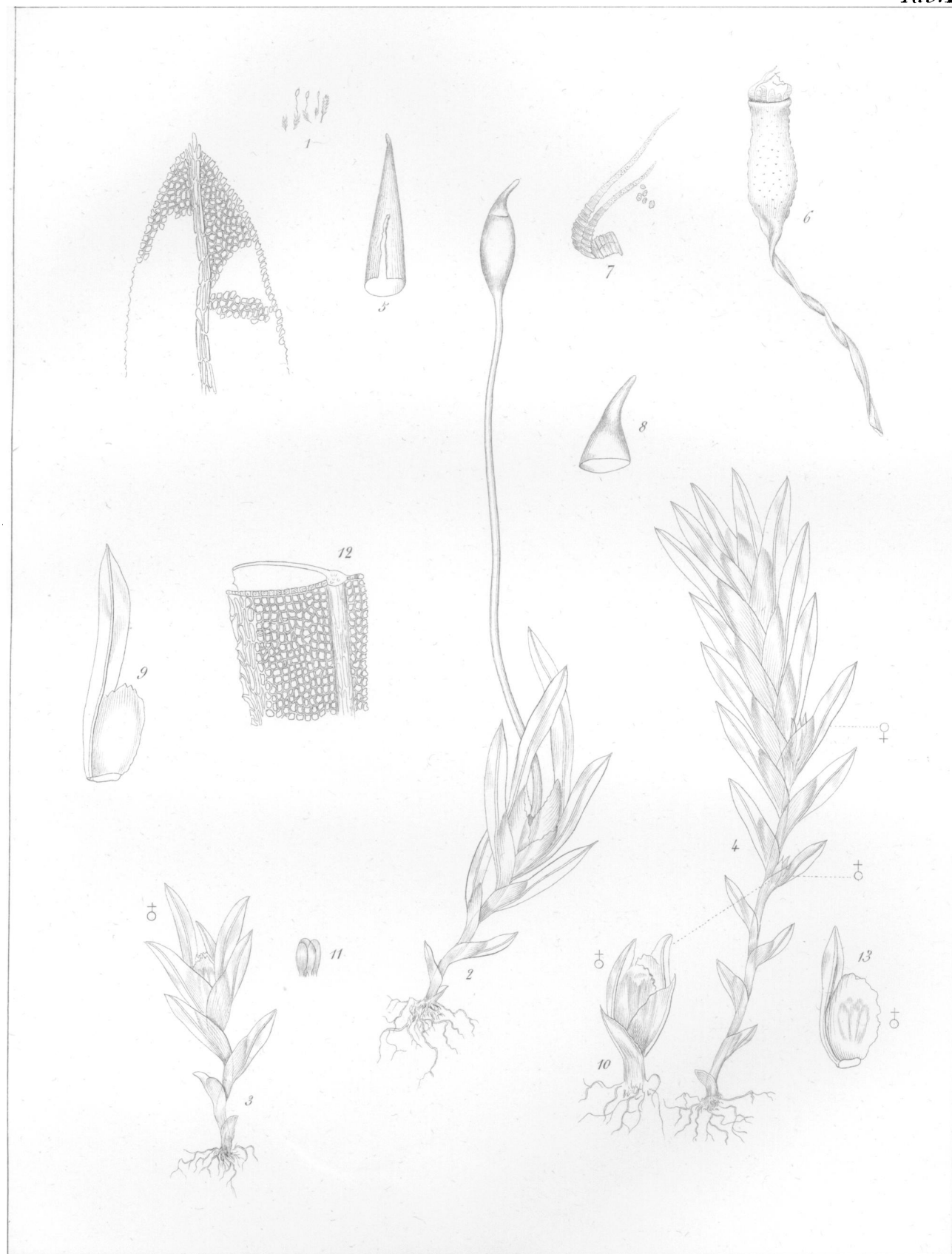


W.S.S. del

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A. Sommel sculp.

*Leskea Fendleri*. Sulliv.

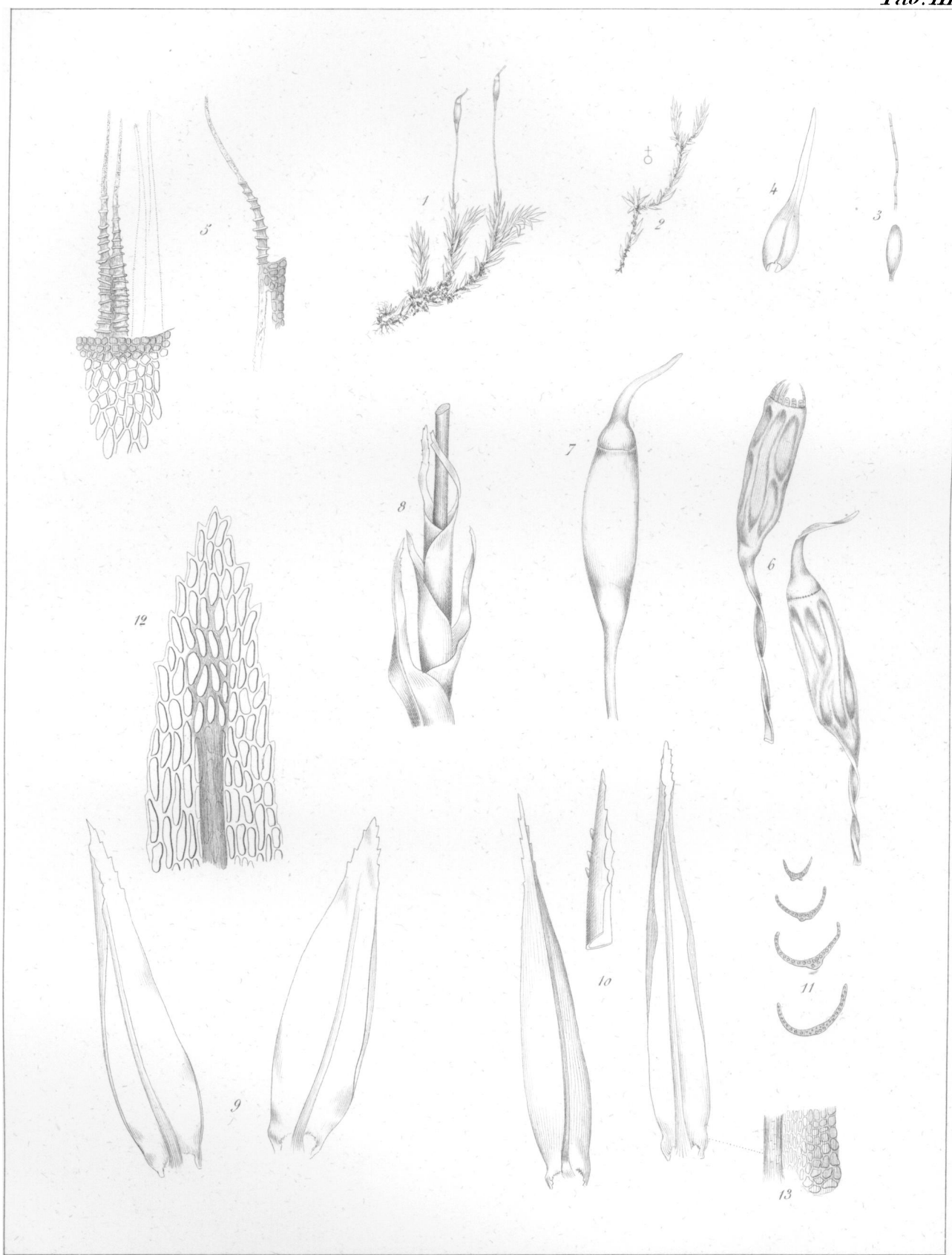


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Tappan & Bradford's lith

A. Sennel sc.

*Fissidens Ravenelii*. Sulliv.

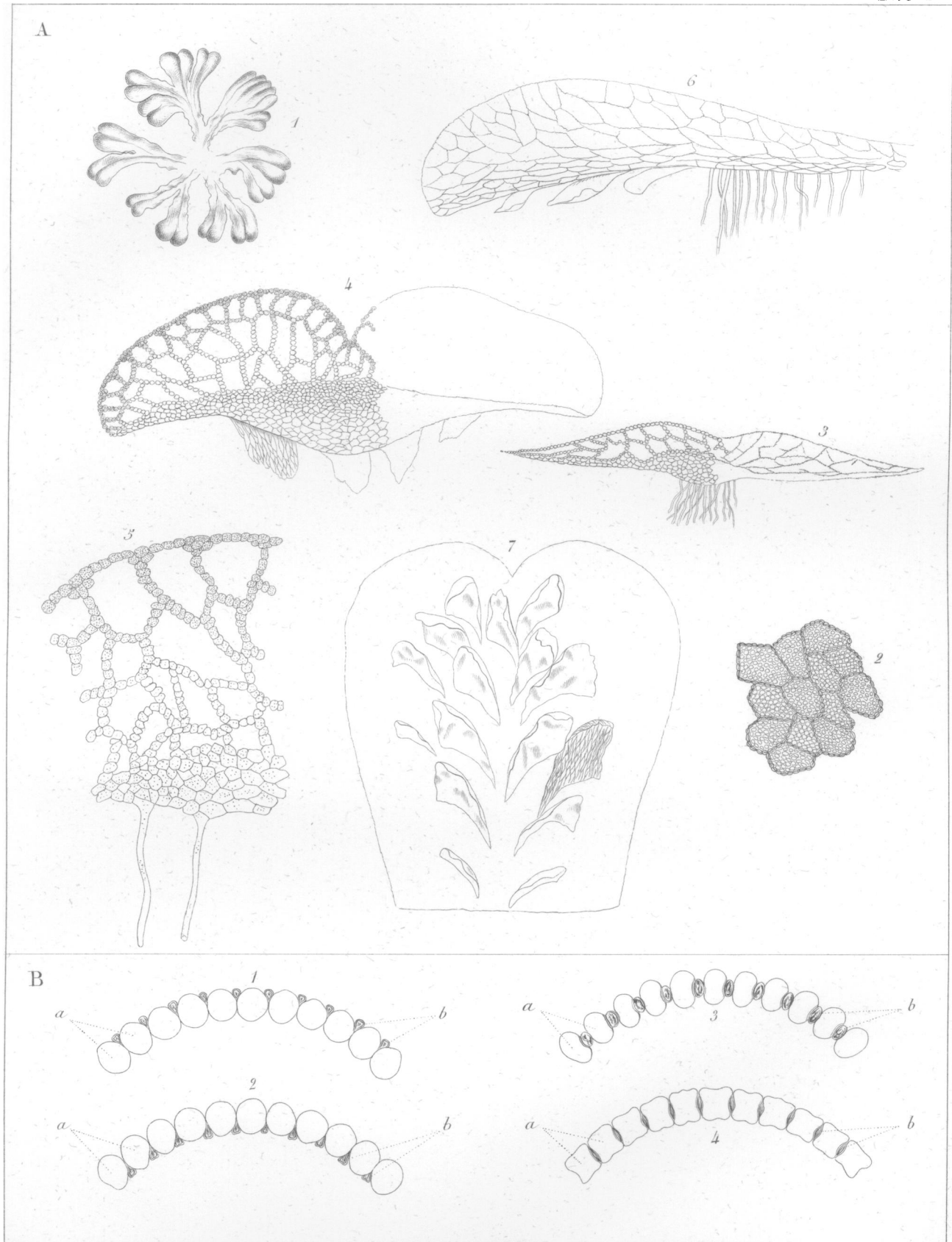


W. S. S. del.

Tappan & Bradford sculp.

A. S. S. sculp.

*Dicranum rhabdocarpum* Full.



W. S. S. del.

Tappan & Bradford's lith.

A. Sorel on stone

A. *Riccia lutescens* Schweinitz. B. Cross sections of leaf of *Sphagnum*.

Tab. V.



W. S. S. del.

Tappan & Bradford's lith.

A. Sorel on stone.

*Hypnum Cakesii* Sulliv.